

INFOTECH

The Digital Dog Ate My Notes:

Tools and Strategies for 21st Century Research Projects

Annette Lamb and Larry Johnson

From the classic excuse "my dog ate my homework" to the new version "my dog swallowed my flash drive," young people are experts at losing their notes.

Online tools and strategies can promote 21st century skills and help students take, organize, store, and share notes for research projects.

The American Association of School Librarians (AASL) recently developed "Standards for the 21st-Century Learner" (2007). These guidelines stress multiple literacies and the use of technology tools through the inquiry process. For instance, standard 1.1.8 states that students must demonstrate mastery of technology tools for accessing information and pursuing inquiry.

RESEARCH IN THE DIGITAL AGE

From charting to outlining, many different methods have been used for note taking. In her book *Teaching the Library Research Process*, Carol Kuhlthau (1994) notes that successful student inquirers use a variety of note-taking strategies depending on the stage of research. Today's researcher may use social bookmarks as they explore possible topics, then build concept maps as they develop and organize ideas.

Electronic journaling, digital note taking, collaborative concept mapping, and online citation building are four ways that students are using technology in the research process.

ELECTRONIC JOURNALING

Whether microblogging ideas for a research project or blogging the entire process, journaling is an effective way to brainstorm

ideas and explore topics. Daniel Callison (2006) suggests using journals to take notes on general topics, new topics, research questions, important names, and linkages to potential resources.

Microblogging tools such as Twitter, <http://twitter.com>, are effective for short, free writing exercises and quick web site sharing.

With online tools such as Blogger, <http://blogger.com>, Edublogs, <http://edublogs.org>, and Word Press, <http://wordpress.com>, students can create public or private notes as they move through the inquiry process. Learners may use the commenting feature to reflect on each stage of their project or ask peers to provide feedback, resources, and suggestions.

AASL standards such as 2.1.4 ask students to use technology and other information tools to analyze and organize information.

DIGITAL NOTE TAKING

Note-taking is the process of writing pieces of information that can later be reviewed.

AASL standard 4.1.7 states that students use social networks and information tools to gather and share information. Although devised in the 1950s, the Cornell note-taking system by Walter Pauk has been adapted for use with online word processors such as Google Docs, <http://docs.google.com> and Zoho Writer, <http://writer.zoho.com>. Students create documents that can be shared with others and published on the web.

The Cornell system includes five Rs: (1) record meaningful facts and ideas; (2) reduce to main ideas and summaries; (3) recite the most important terms, concepts, ideas, and conclusions; (4) reflect on personal opinion and perspective; and (5) review.

AASL standard 4.1.6 states that students organize personal knowledge in a way that can be called upon easily. Social bookmarks allow young people to easily organize online resources for both school and personal activities. Tools such as Delicious, <http://delicious.com/>, allow users to mark web pages, add tags that describe the web page, and write short descriptions. These bookmarks can be shared with others. For instance, a history class may share outstanding web sites related to World War II or the media specialist might create bookmarks for the Halifax Explosion of 1917 (see Figure 1).

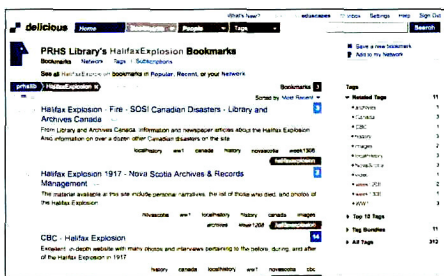


Figure 1. Delicious Social Bookmarks.

Figure 2. NoteStar.

While journals and hand-written notes can be useful in research, Danny Callison (2006) identified four note taking activities for use with web pages. Students (1) highlight key terms and statements; (2) write a summary; (3) recite what they've learned; and (4) cite their source.

An increasing number of web sites provides tools for the types of activities Callison describes. NoteStar, <http://notestar.4teachers.org/>, allows students to collect and organize notes (see Figure 2). Teachers can create, assign, and manage assignments.

The Awesome Highlighter, <http://www.awesomehighlighter.com/>, is a simple tool for web page highlighting that can be used by children of all ages (see Figure 3).

Tools such as Diigo, <http://diigo.com>,

provide social bookmarks, highlights, and sticky note tools that can be used to identify and annotate individual web pages. AASL Standard 4.3.1 states that students participate in the social exchange of ideas, both electronically and in person. As a social network, Diigo provides collaborative sticky notes and discussion groups where students can share what they have learned.

In the Powerful Poetry activity, students select, bookmark, highlight, and annotate a favorite poem. They share their exploration with peers in the discussion group (see Figures 4a and 4b). Through this assignment, students address a number of AASL Standards including:

2.1.2 Organize knowledge so that it is useful.

4.1.5 Connect ideas to own interests and previous knowledge and experience.

3.2.2 Show social responsibility by participating actively with others in learning.

COLLABORATIVE CONCEPT MAPPING

Concept maps provide a way for student inquirers to visualize the relationships and connections among ideas. Tony Buzan, author of *The Mind Map Book* (1990) stresses that traditional approaches to note taking obscure the key words, make information difficult to remember, waste time, and fail to stimulate the brain. Buzan suggests that mind mapping is a more organic process for extracting and organizing information.

Online tools such as Gliffy, <http://www.gliffy.com/>, and Webspiration, <http://www.mywebspiration.com/>, allow students to work collaboratively on concept mapping activities. Teachers are able to see the history of their work as well as the contributions by each participant.

Students can work together to build understandings. Examine the concept map shown in Figure 5 focusing on medical personnel and departments in the American Civil War. Students incorporated text and images along with notes and citations.

Collaborative concept maps address many of the AASL standards including:

1.1.9 Collaborate with others to broaden and deepen understanding.

2.1.5 Collaborate with others to exchange ideas, develop new understandings, make decisions, and solve problems.

3.1.4 Use technology and other information tools to organize and display knowledge and understanding in ways that others can view, use, and assess.

ONLINE CITATION BUILDING

The collection and organization of citations is important throughout the research process. In his book *Using Sources Effectively: Strengthening Your Writing and Avoiding Plagiarism*, Robert Harris (2002) stresses that quotations can provide authority, context, and relevance to an essay and notes that citations guide readers by providing a literature trail.

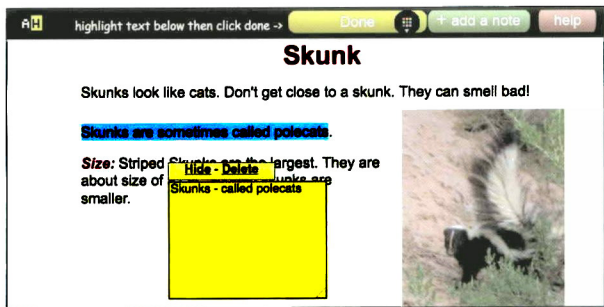


Figure 3. Awesome Highlighter.



Powerful Poems

Some poems leave a lasting impression on the reader.

- Which poems do you find particularly powerful?
- What poetry approaches and techniques are used? Why?
- What do you find interesting about the poems?
- How do they connect with your thoughts or life?

Your Mission: Share Powerful Poems with your Peers

Follow these steps:

1. Explore poems at <http://poets.org>.
2. **Bookmark** at least three poems using the Diigo tools. Be sure to share with the group.
3. Annotate these poems using the **Highlight and Comment** tool. Be sure to share with the group.
4. Use the **Send** tab to **Get Annotated Link** and use it in your assignment.
5. After taking notes on the poems, use the **Send** tab to **Extract Annotations** and write about your favorite poem.
6. Go to the class **Group** and post your poem entry as a **Reply** in the **Powerful Poems** class forum.

Figure 4a. Powerful Poetry Assignment.

Online tools such as NoodleTools, <http://www.noodletools.com/>, Citation Machine, <http://citationmachine.net/>, and BibMe, <http://www.bibme.org/>, make this process easy.

Use online citation builders as part of a larger discussion of copyright issues and intellectual property. AASL standards that could be incorporated include:

1.3.1 Respect copyright/intellectual property rights of creators and producers.

1.3.3 Follow ethical and legal guidelines in gathering and using information.

DIGITAL ISSUES

When using technology for note taking and other information extraction activities,

students need to be reminded of issues they may face. Here are a few important ones:

Plagiarism. Encourage students to write about their understandings and make connections to prior knowledge rather than simply copying information from the web into their electronic notes. Poor note taking skills contribute to plagiarism. Stress the importance of using quotations around copied text and developing a list of references.

Back up Files. Whenever data is stored at a remote site, there is a chance it could disappear. Many web sites provide an option to download or print materials. Encourage students to create a backup system for project storage.

Read the Fine Print. When signing up

The screenshot shows the Poets.org website interface. At the top, there's a navigation bar with links like 'View Cart', 'Log In', 'Search', 'Subscribe', and 'More Info'. Below this is a search bar and a list of categories: 'POETS & POETRY', 'POETRY STORE', 'ABOUT US', 'DONATE', 'POETRY NEAR YOU', and 'FOR EDUCATORS'. The main content area displays the poem 'Still I Rise' by Maya Angelou. On the left, there's a sidebar with 'Find a Poem or Poet' and 'Advanced Search' options. The poem text is in the center, with several Diigo annotations (highlighted text and comments) visible. For example, one annotation says 'You may write me down in history / With your bitter, twisted lies, / You may trod me in the very dirt / But still, like dust, I'll rise.' Another annotation asks 'Does my sassiness upset you? / Why are you beset with gloom? / 'Cause I walk like I've got oil wells / Pumping in my living room.' The bottom of the page shows more annotations and a 'Print' button.

Figure 4b. Diigo Annotations on Maya Angelou Poem at www.Poets.org.

BOOKMARKIT

JOHN PETERS



PICTURE BOOKS

ROBOTS

Baby Brains and RoboMom. Simon James. Candlewick, 2008. \$15.99. 978-0-763-63463-6. Grades 1-3. The toddler with the titanic IQ cobbles together a mechanical mother to give his real one a break—and amid trailing smoke it runs amok, washing him in the sink with the dirty dishes, hanging him out on the line to dry and threatening worse. Baby Brain's appearances feature lots of verbal and visual jokes, plenty of action, and, at the end, a worthy reminder that there's no substitute for parental cuddles.

Cosmo and the robot. Brian Pinkney. Greenwillow, 2000. \$15.95. 978-0-688-15940-5. Grades 1-3. Packing his handy tool belt, a young colonist ventures out onto the surface of Mars where he saves his pesky sister from a malfunctioning robot that, with a little adjustment, turns out to be a perfect playmate. The space suit clad children inhabit a believably desolate landscape but behave just like bickering sibs back on Earth.

R. Robot saves lunch. R. Nicholas Kuszyk. Putnam, 2009. \$16.99. 978-0-399-24757-6. Grades K-2. A super-capable robot brings an extra head in to work one day and solves a mystery while averting disaster in the robot factory lunchroom. Oddball, brightly hued robots in Kuszyk's illustrations add notes of high comedy to this robotic romp.

Mama Robot. David Cali. Ill. Anna-Laura Cantone. McClelland & Stewart, 2008. \$17.95. 978-00887-76873-6. Grades 1-3. A child with a working mother imagines having a robot parent, who would always be at home to make his favorite foods, do his homework, and even take care of bullies. In comical illustrations a wheeled Mom who looks like a vacuum cleaner with bendable arms zips busily about, but lacks the softness and other characteristics of a flesh and blood mother. Making a wise choice, the lad opts for a robot puppy instead.

**YA NON-FICTION**

21ST CENTURY TECH

Cybercrime (Forensic Science Investigated). Rebecca Steffoff. Marshall Cavendish, 2009. 978-0-7614-3084-1. \$34.21. Grades 6-10. Beginning with an explanation of forensics in general, the reader learns how forensic science can help solve computer crimes, as well as how to protect themselves from cybercrime. Back matter includes a glossary, Internet sites, bibliography, and an index.

Future tech: From personal robots to motorized motorcycles (National Geographic Investigates). Charles Piddock. National Geographic, 2009. \$14.00. 978-1-4263-0468-2. Grades 6-12. Today's technology incorporates concepts that were once science fiction, like beings that have artificial parts called cyborgs, and the probability of far more advanced systems, like computer interfaces to benefit the paralyzed. The detailed index, bibliography, and glossary make this research worthy for students.

Technology: Ethical debates about the application of science (Dilemmas in Modern Science). Jon Turney. Black Rabbit Books, 2009. 978-0-8225-7135-3. \$34.25. Grades 6-12. Should nanotechnology be limited in making weapons? Should everyone's DNA be in an international database? These are the types of questions posed in the "You Decide" sidebars. A timeline, books, web sites, in-depth glossary, and an index round out this thought-provoking title.

Video Game Designer (Cool Careers). Kevin Cunningham. Cherry Lake, 2009. 978-160279-305-7. \$18.95. Grades 4-8. This high/low title provides students with a fresh look at a hot topic career! Chapters include "The Evolution of Video Games" and "Education and Training." Additional titles in the Cherry Lake's 21st Century Skills Library series of Cool Careers introduce students to other appealing careers such as Athletic Trainer and FBI Special Agent. Brief biographical sketches of several famous video game designers, a glossary, and an index conclude this title.

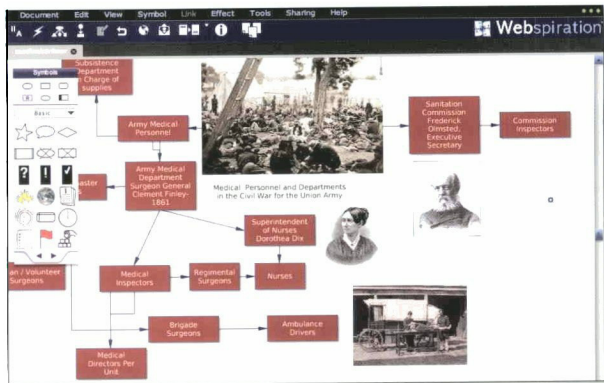


Figure 5. Webspiration Project.

for services, many teachers and students ignore the rules and regulations. Some services do not allow children under age 13 to participate, while others reserve the right to use content for commercial purposes.

Permanent URLs. When citing sources, many students fail to check the URL they have copied to be sure that it can be used later. For instance, rather than citing Google Images, the specific web site containing the image should be cited. When using an electronic database, a permanent link is sometimes provided at the bottom of the page. Use this address rather than the URL in the location area of the browser. When citing a blog, students should select the particular blog entry rather than the URL for the entire blog.

Online Safety. Many of the online tools incorporate elements of social exchange. Young people must learn safe and ethical behavior in personal electronic communication and interaction.

Technology tools provide a wide range of options and opportunities for student inquiry. Although guidelines and scaffolding are important to student inquirers, Daniel Callison (2006), reminds media specialists that "the decision-making process for information extraction and transfer be left to the experienced student inquirer rather than be a dictated task from the teacher (p. 555)."

RESEARCH PROJECT AND THE TEACHER-LIBRARIAN

Effective note taking involves much more than simply copying information for use later. Virginia Rankin (1999, pp. 1-6) suggests that young people need strategies for extracting useful information from texts. She describes the note taking process in seven steps: (1) know what information you are seeking; (2) preview the reading; (3) select relevant information by skimming and scanning; (4) read relevant information; (5) evaluate your reading; (6) summarize only useful information, and (7) review your notes.

It is helpful to design focused activities where students can practice their note taking skills. When possible, connect these note taking experiences with specific standards such as standard 2.4.1 asking students to determine how to act on information (accept, reject, modify).

In addition to subscription-based electronic databases, web sites containing articles, or databases of information work particularly well for these types of activities.

Biographical Information

Biography, <http://www.biography.com/>

Nobel Prize Winners, http://nobelprize.org/prize_awards/

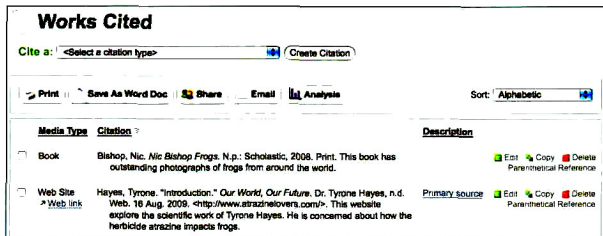


Figure 6. NoodleTools Citations for a Frog Project.

Field Guides

Butterflies and Moths, <http://www.butterfliesandmoths.org/>

Enature Field Guides, <http://www.enature.com/fieldguides/>

Government Information

Occupational Outlook Handbook, <http://www.bls.gov/OCO/>

Supreme Court Decisions—Oyez, <http://www.oyez.org>

Poetry

Poetry Archives, <http://www.poetryarchive.org/>

Poets.org, <http://poets.org>

News and Article Archives

National Geographic, <http://news.nationalgeographic.com>

Scholastic Article Archive, <http://teacher.scholastic.com/researchtools/>

Health and Science Topics

KidsHealth, <http://kidshealth.org/kid/>

Science News for Kids, <http://www.scienceforkids.org/>

CONCLUSION

Online tools can promote critical and creative thinking associated with the process of research. Rather than focus on the technology, stress how online tools can be used to solve problems or meet the need of a particular phase in the inquiry process. When partnering with classroom teachers on research assignments, identify the specific tools and strategies students will need to be successful. Instead of trying to do everything at once, focus on one of the four areas (journaling, note taking, concept mapping, citation building) and build skills over time.

REFERENCES

Buzan, T. & Buzan, B. (1990). *The Mind Map Book: How to Use Radiant Thinking to Maximize Your Brain's Untapped Potential*. New York: Plume.

Callison, D. & Preddy, L. (2006). *The blue book on information age inquiry, instruction and literacy*. Santa Barbara, CA: Libraries Unlimited.

Harris, R. A. (2002). *Using sources effectively: Strengthening your writing and avoiding plagiarism*. Glendale, CA: Pyczak Publishing.

Kuhlthau, C. C. (1994). *Teaching the library research process*. Lanham, MD: Scarecrow Press.

Rankin, V. (1999). *The thoughtful researcher*. Santa Barbara, CA: Libraries Unlimited.

NOTE: To learn more, go to an online workshop at <http://www.eduscapes.com/sessions/notes/>.

BOOKMARKIT

JOE SUTLIFF SANDERS



GRAPHIC NOVELS

NEW TEEN CLASSICS

Alan's War: The memories of G.I. Alan Cope. Emmanuel Guibert. First Second, 2008. \$24.00. 978-1-59643-096-9. Grades 9 and up. When Guibert met Alan Cope, he had no idea he would strike upon one of the most personal storytellers to fight in World War II. Alan's memories of the war and its aftermath are of quiet, unsolved mysteries—the squirrels that assembled for dinner in a French-style castle in California; the legendary pianist with ruined hands; and the Czech girl who begged Alan to return to her home only to vanish between one night and the next. The result is an intimate story of friendships earned and lost.

RASL: The drift. Jeff Smith. Cartoon Books, 2009. \$13.00. 978-1-888963-20-5. Grades 9 and up. From the creator of *Bone* comes a much creepier, even nightmarish story of a talented thief trying to escape the consequences of his own mind-bending discovery. Driven by multiple mysteries, the story is both darker and more gripping than *Bone*.

Sloth. Gilbert Hernandez. DC Comics/Vertigo, 2008. \$14.99. 978-1-4012-0368-9. Grades 9 and up. Lita is a drummer in a band with her boyfriend. Or maybe she's the secret lover of a boy from a completely different clique. Or maybe she's falling out of love with her boyfriend and into love with the timid local hero, a boy who has taken the pop world by storm...and who exactly resembles the guitarist in her high school band. These metaphorically linked stories slide together in a poetic tale about a legendary orchard and the secrets buried there.

Rachelle Lasky Bilz: Author of *Life Is Tough: Guys, Growing Up, and Young Adult Literature*; freelance writer; retired high school librarian. bilzrm@gmail.com

Reid Goldsborough: Author of *Straight Talk About the Information Superhighway*. reidgold@netars.com, <http://members.home.net/reidgold>

Suzanne Myers Harold: School Corps Librarian, Multnomah County Library, Portland, OR. suzharold@gmail.com

Sara Catherine Howard: Adjunct instructor, Department of Library Science, Sam Houston State University, Huntsville, TX. lis_sch@shsu.edu

Larry Johnson: Professor, School of Library and Information Science, Indiana University-Perdue University, Indianapolis, IN. ljohnson@mail.escapees.com

Erlene Bishop Killeen: District Media Coordinator and Elementary Library Media Specialist for the Stoughton Area School District; adjunct instructor at the University of Wisconsin, Oshkosh. erlene.killeen@stoughton.k12.wi.us

Annette Lamb: Professor, School of Library and Information Science, Indiana University-Perdue University, Indianapolis, IN. alamb@eduscapex.com

David Loertscher: Coeditor of *Teacher Librarian*; professor, School of Library and Information Science, San Jose State University, San Jose, CA; president of Hi Willow Research and Publishing; and past president of the American Association of School Librarians. dloertscher@teacherlibrarian.com

Elizabeth "Betty" Marcoux: Coeditor of *Teacher Librarian*; assistant professor, Information School, University of Washington. b.marcoux@verizon.net

Kathleen Odean: Librarian, speaker, and author of *Great Books for Girls* (revised 2002) and other guides. Rhode Island. kathleenodean@hotmail.com, www.kathleenodean.com

John Peters: Supervising Librarian of the Children's Center at 42nd Street, The New York Public Library, New York. cf071@yahoo.com, <http://tinyurl.com/59s5jp>

Julie M. Prince: Freelance writer and reviewer of books for children and young adults. www.julieprince.com

Joe Sutliff Sanders: Assistant professor of children's and young adult literature, California State University. joess@csusb.edu

Joanne Troutner: Director of media/technology, Tippecanoe School Corp, and owner, Creative Computer Enterprises, Lafayette, IN. troutner@mindspring.com, www.jtroutner.com

Betty Winslow: Media center director, Bowling Green Christian Academy, Bowling Green, OH. freelancer@wvnet.org

Advertiser Index

- 57 **Earth Day Canada**
www.ecokids.ca
- 59 **KCDL**
www.kcdonline.com
- 67 **Resource Links**
www.resourceinlinksmagazine.ca
- 39 **Rowman & Littlefield Education**
www.rowmaneducation.com
- 33 **Rowman & Littlefield Publishers**
www.rlpbooks.com
- 3, 13, 63 **Scarecrow Press, Inc.**
www.scarecrowpress.com
- 49 **Teaching with Picture Books**
www.teachingwithpicturebooks.com
- 69 **VOYA**
www.voya.com
- 51 **Young Adult Library Services Association**
www.ala.org/yalsa/onlinecourses

Extent and Nature of Circulation	Average No. Copies Each Issue During the Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total no. of copies printed (Net press run)	7000	7000
B. Paid and/or Requested Circulation		
1. Sales through dealers and carriers, street vendors and counter sales	0	0
2. Mail Subscription	5561	5685
C. Total Paid and/or Requested Circulation	4867	5083
D. Free Distribution by Mail, Carrier, or Other Means: samples, complimentary, and other free copies	693	602
E. Total Distribution	6254	6287
F. Copies Not Distributed		
1. Office use, left over, unaccounted, spoiled after printing	746	713
2. Return from News Agents	0	0
G. Total	7000	7000

I certify that the statements made by me above are correct and complete.
Edward M. Kurdyla, Publisher.

STATEMENT REQUIRED BY THE ACT OF AUGUST 12, 1970, SECTION 3685, TITLE 39, UNITED STATES CODE SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF *Teacher Librarian*: The Journal for School Library Professionals, published bimonthly except July/August at 4501 Forbes Blvd., Suite 200, Lanham, MD 20706 for October 1, 2009. Number of issues published annually: 5. Annual subscription price: \$56. The General Business Office of the Publisher is located at 4501 Forbes Blvd., Suite 200, Lanham, MD 20706.

The names and addresses of the Publisher and Managing Editor are: Publisher, Edward M. Kurdyla, 4501 Forbes Blvd., Suite 200, Lanham, MD 20706; Managing Editor, Corinne O. Burton, 4501 Forbes Blvd., Suite 200, Lanham, MD 20706.

The owner is Scarecrow Press, 4501 Forbes Blvd., Suite 200, Lanham, MD 20706, which is a wholly owned subsidiary of the Rowman & Littlefield Publishing Group, 4501 Forbes Blvd., Suite 200, Lanham, MD 20706. The known bondholders, mortgages, and other security owning or holding one percent or more of total bonds, mortgages, or other securities are: none.